



TORONTO PUBLIC LIBRARIES

REFERENCE LIBRARY

BR(S) 386.592

THE LAKES AND CANALS OF CANADA.

A PAPER READ AT THE ROYAL UNITED SERVICE INSTITUTION.

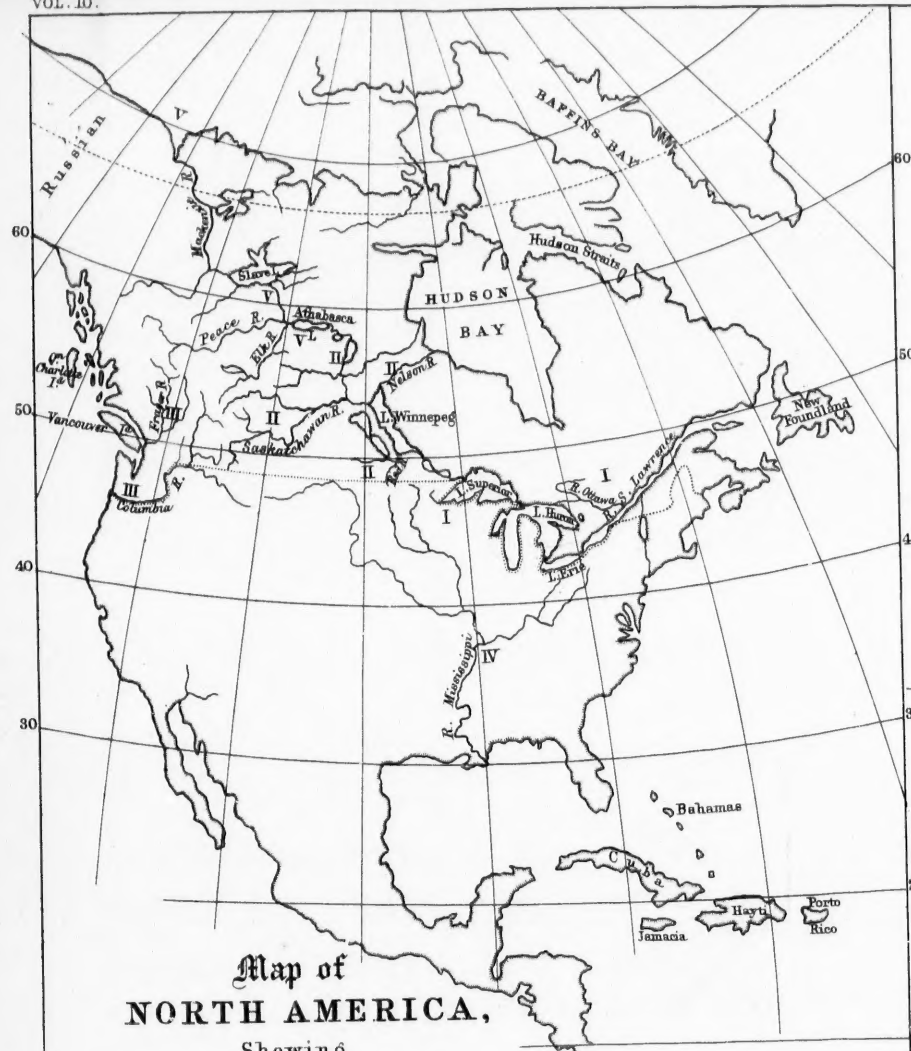
(Authors alone are responsible for the contents of their respective memoirs.)

C 42992



AUG 4 1983

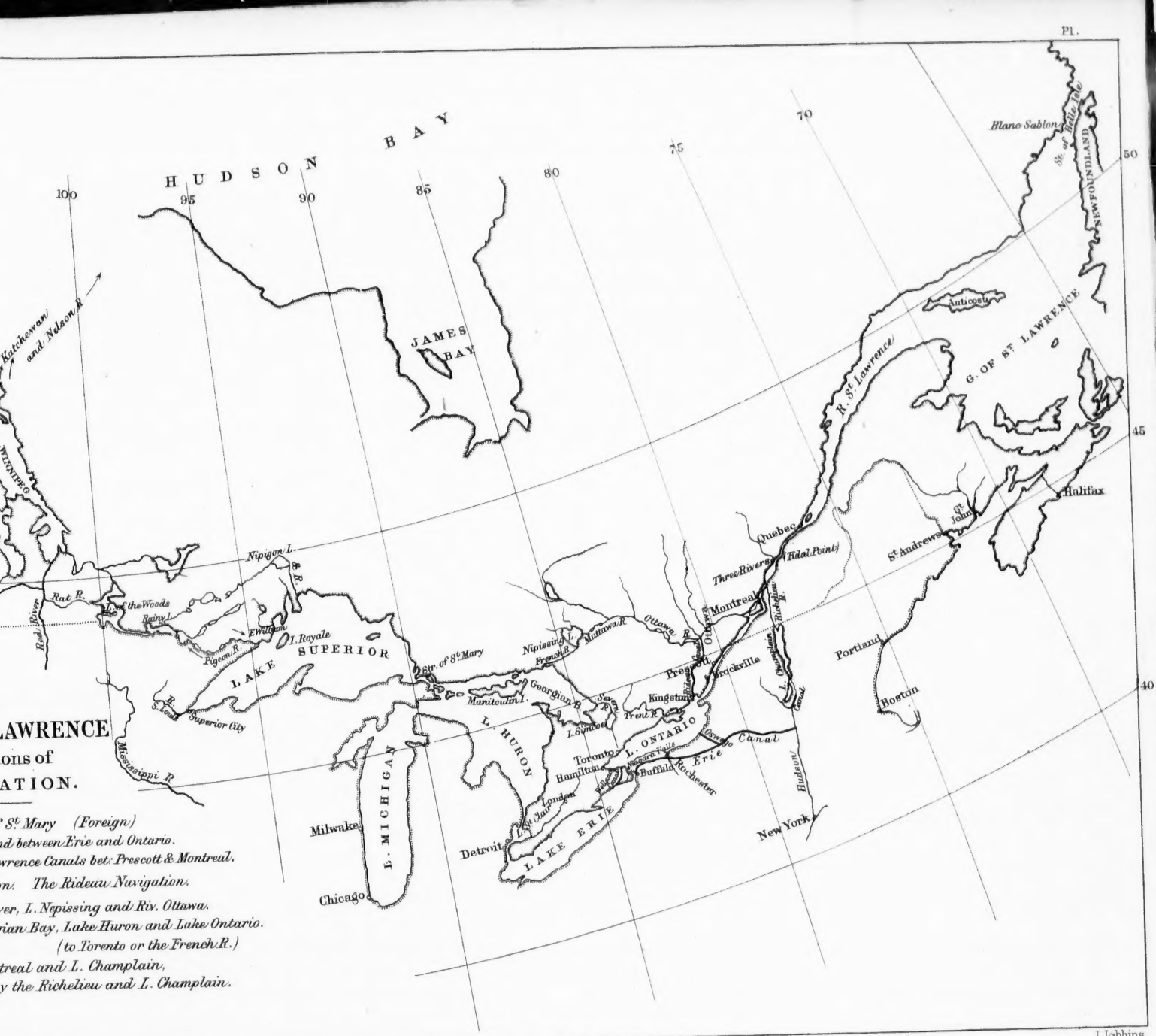


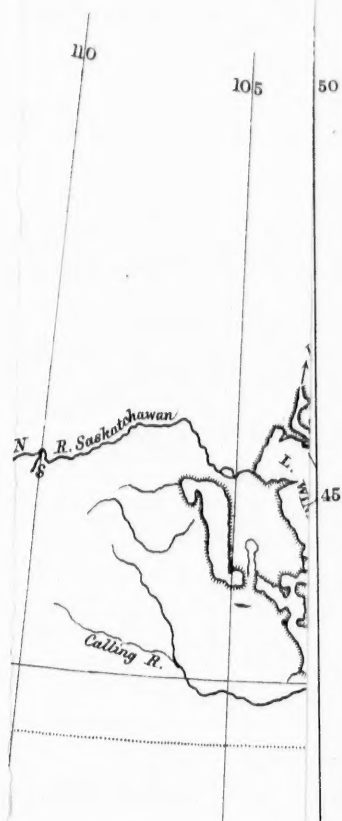


- I. St. Lawrence.
- II. Saskatchewan.
- III. Pacific. {Fraser
Columbia
- IV. Mississippi.
- V. Mackenzie.

**Map of the
WATERS OF THE ST. LAWRENCE**
Shewing the Directions of
CANAL NAVIGATION.

- On the Chain of Great Lakes and the Frontier. { St. of St. Mary (Foreign)
Welland between Erie and Ontario.
St. Lawrence Canals bet. Prescott & Montreal
- Between Montreal and Kingston. The Rideau Navigation.
- Routes proposed { By French River, L. Nepissing and Riv. Ottawa.
Between Georgian Bay, Lake Huron and Lake
(to Toronto or the French)
Between Montreal and L. Champlain,
or by the Richelieu and L. Champlain





Map of the
WATERS OF THE ST. LAWRENCE
 Shewing the Direction
 of CANAL NAVIGATION

the Chain of Great Lakes { St. of St.
 the Frontier. { Welland b
 { St. Lawrence
 between Montreal and Kingston.
 { By French River,
 { Between Georgian
 { Between Montreal
 { or by the

T
 the
 in s
 a n
 and
 C
 larg
 and
 and
 are
 with
 nav
 cati
 dete
 T
 from
 min
 Am
 but
 from
 Win
 the
 whic
 Sash
 tain
 to fl
 Bay

(For private circulation only.)

Evening Meeting.

Monday, March 19th, 1866.

Rear-Admiral Sir F. W. E. NICOLSON, Bart., C.B., in the Chair.

THE LAKES AND CANALS OF CANADA.

By Lieutenant-Colonel MILLINGTON SYNGE, R. E.

THE chain of the great lakes of Canada is part of the water system of the St. Lawrence, and the canals of that country are works, distributed in several localities, but all with one common aim, which is to complete a navigation that is unrivalled both for extent and quality as an inland and freshwater navigation.

Canada is remarkable, even to a disadvantageous extent, for the large proportion of its surface which is taken up with rivers and lakes, and more particularly with lakes which intersect it in every direction, and, together with the rivers, occupy almost or altogether one-half the area of the province. This large distribution of water is not, however, without its advantages, and the directions which the main arteries of navigation pursue throughout the British-American territory are indicative of a future of activity and prosperity which it requires only determination and courage to attain.

The St. Lawrence system pursues its course with steady uniformity from west to east. Its head waters closely approach, or actually mingle with, those of the system of the plains of Central British America, the waters of which find their way into the same Atlantic, but possess a striking diversity of characteristics, in that they converge from all the cardinal points of the compass. The basin of Lake Winnipeg gathers from the east, streams which are in proximity with the waters of the St. Lawrence, from the south the Red River, which connects it closely with the Mississippi, and the magnificent Saskatchewan rolling down from the summit level of the Rocky Mountains of the West unites with these in that same basin of the Winnipeg to flow in one volume to the north through Nelson River into Hudson Bay, and thence to the Atlantic. Again, the head-waters of the

B

Saskatchewan commingle at their sources with others flowing out from the same springs, but which, by an opposite outlet, find a comparatively short but tumultuous passage into the Pacific ocean.

Another system not inferior either in extent or grandeur to any of these occupies the north-west corner of the continent, and completes that penetration by natural water-paths which characterises all British North America in a remarkable degree. The magnificent Mackenzie River, which pours into the Arctic Sea, gathers its tributaries on the tops of the Rocky Mountains from among the same fountains which supply the Frazer and Columbia rivers of the Pacific and the Saskatchewan of the Atlantic, whilst by its arms or its connections stretching out towards the east, by the Athabasca and Churchill rivers, or their branches flowing in opposite directions out of Lake Wollaston, it comprises an actual waterway, with obstructions, but without interruption of flowing water, on the track of a north-west passage.

Thus there are four great water systems which, speaking broadly and generally, may be said to form and to express the characteristics of the regions in which they severally are, and in so far to govern the conditions of those regions as they determine the directions of travel and intercourse within their respective limits. These are the St. Lawrence in the east, the Saskatchewan in the west, the Mississippi in the south, and the Mackenzie in the north, and it is essential to the right appreciation of the character and value of the formation that lies within the province of Canada to bear in mind its character and position as an unit in, or an element of, the entire water system of the continent, and the penetration of the St. Lawrence and Saskatchewan together to the very foot of the Rocky Mountains.

Before passing to the more detailed consideration of that branch of these waters which is more particularly the subject of this paper, it may serve its scope and object to draw attention to one or two maxims, truisms perhaps, but apt to fare as such in being as much disregarded in practice as they may be promptly conceded in argument.

Firstly. Directions of commerce shape the course of nations.

Secondly. Means of communication influence so as to determine the directions of commerce.

And, lastly, an insular position has singular advantages for purposes of commerce and for defence.

These principles, or truisms, have this bearing on Canada, her lakes and her canals, that her inland navigation places certain great advantages within the reach of her attainment. The full benefit of these she can secure only by following the indications of her broadly marked physical geography in her works of construction, and by her adoption in her commercial regulations of measures which will at the same time satisfy the proper exigencies of her political position. If she do this she will immeasurably increase her own material prosperity, and in so doing she may do yet more, for the direct tendency of these acts would be lastingly to determine the character of her nationality. She would render her future secure, and the development of her resources certain as an intimate, an honoured, and a valuable component of the empire.

The security of her territory, and the full confidence that it is secure, is the great want of Canada. This is, in fact, the question which determines, for both parties, the real value of all colonial possessions. Capital flows to attractive fields if they be secure, and contentment waits upon industry labouring in security.

In the case of Canada, political, industrial, and commercial, rather than purely military measures, are needed to confer upon her this security and its assurance. Her inland navigation is superior to any means of communication that can be brought into competition with it; but her articles of export, lumber, grain, flour, and the like, are bulky, whilst, on the contrary, her imports are manufactured articles occupying small bulk. Vessels consequently obtaining in general only a cargo one way, ocean freights have hitherto more than counterbalanced the advantages of her inland superiority; but Canada has it in her power to create an import carrying trade that shall reverse this condition by the further improvement of her navigation, and by the adoption of a tariff more truly adapted to her real interests, especially aided, as her endeavours would be, by the existence, side by side of such better policy, of the prohibitive commercial legislation of the adjoining federal republics.

I have no doubt but that I shall best comply with the wishes of the Committee if I adapt the considerations that follow rather to the sphere of this Institution, than enter upon such as are more strictly fitted to geographical or engineering discussion. I purpose, therefore, to describe the navigation of Canada, the nature and position of the expanses of water that form the lakes, and the works which constitute the canals, very briefly, dwelling more upon the advantages conferred by that navigation, and on the bearing and importance of those advantages. In the Appendix to this paper you will, however, find, I trust, all that information given fully which it might prove tedious verbally to recapitulate.

The water system of the St. Lawrence begins nearly midway across the continent. Under the name of the River San Louis, its head-waters flow into Lake Superior at the south-western extremity of the lake in about $46^{\circ} 36'$ N. lat. and 92° W. long., at Fond du Lac, the site of the present Superior City, Minnesota, and these waters define the boundary of British America as it would be determined by the mid-channel of the waters of the St. Lawrence and the lakes. The actual boundary has, however, been carried on a higher parallel of latitude, (about that of $47^{\circ} 15'$) where a chain of comparatively trivial rivulets and small lakes terminates in Lake Superior; and Ile Royale, which is intersected by that parallel, has also been yielded by treaty. The geographical position of the tract thus marked gives it extraordinary value. Between these boundaries north and south; and between Lake Superior on the east and the western boundary of Minnesota, is an area of about 30,000 square miles, or of an extent equal to about that of Scotland. Over it the communication with the colony of Red River is already established by means of railroads, steamers, and stages, which traverse its unobstructed highways. The harbour of Superior City is good, and it is the natural outlet of a great part of the country westward. Enjoying

the double advantage of being in immediate proximity to old established countries—that is, comparatively speaking—and of being of prairie rather than of granitic formation, it has become the channel of intercourse with the Red River country, whilst circumstances and a granitic formation have combined to retard the opening of that intercourse through the northern tract that has been kept in the dominion of England. The other chief western head-waters of the St. Lawrence are the Kamenis Toquioah River, at the mouth of which Fort William, a post of the Hudson Bay Company, is situated, and the Nepigon River, a sheet of water of large but unknown extent, not that its borders have not been explored, but its dimensions are not known to have been ascertained. Both are within British territory, and are admired for the wild beauty of their scenery, and the latter for the well nigh unequalled sport which both river and lake yield to anglers and fishermen. They are also said to afford the means of comparatively easy communication on the westward route towards Lake Winnipeg. The Kamenis Toquioah River is known for its romantic falls, a beautiful sketch of which appears in a folio of drawings by Captain Warre, taken so far back as about 1845.

Lake Superior, 300 miles long and 140 miles broad, is of rather larger dimensions than the extent of country just spoken of. Its surface comprises 32,000 square miles, which is about the same area as that of Ireland. It has been said, possibly rather with effect than with strict accuracy, that the mean surface of the lake is exactly 600 feet above the sea level, and its bottom 600 feet below that level. This assigns to the lake a depth of 1,200 feet. I have heard that in places a line of that length has failed to touch the bottom; but I believe the mean depth of the lake to be about 1,000 feet. The straits or river of St. Mary conveys the overflow of this enormous basin, and connects Lake Superior with lakes Michigan and Huron. This river falls 20 feet within a distance of half a mile. The impediment which is thereby caused to the navigation is overcome by a canal, the works of which are of the most perfect description; but they are on the alienated side of the river. The mean depth of these lakes is said to be the same as that of Lake Superior. The area of Lake Michigan is 17,000 square miles, that of Lake Huron 21,000 square miles: the latter only is within British territory. The continuous formation of the islands of Manitoulin, which seem but an extension of the northern promontory of Upper Canada that stretches into Lake Huron forms the Georgian Bay, itself an inland sea that is of the very highest importance with reference to the maintainance of the power of England in America.

Lake Huron, particularly in its lower portion, tends directly to the south. The River St. Clair, which expands about midway in its course into a small lake of the same name, connects the waters of Lake Huron and of Lake Erie. Many wrecks take place on the St. Clair flats, and the navigation is treacherous as well as difficult; but there is no fall or impediment in the river. Lake Erie turns abruptly to the east. The level of its waters is 10 feet below that of the waters of Lake Huron. It is a smaller sheet of water, in fact only one-third the size of the former, having a surface of 7,500 square miles, which is, how-

ever rather more than twenty times the joint area of the Channel islands and of the Isle of Man. Lake Erie is exceptionally shoal, having a mean depth of only 120 feet. It is astonishing no limited liability company springs up to drain it. The soil is very fertile, and the chasm of the Niagara River close at hand for an outlet.

The waters of Lake Erie pour down the Niagara River into Lake Ontario, but its celebrated falls separate the navigation of these lakes, excepting for vessels not beyond the capacity of the locks of the Welland Canal. There is a difference of 330 feet between the levels of these lakes. A descent of about 50 feet takes place in the rapids above the falls, and the vertical fall of the cataract itself is 165 feet. The torrent is hemmed in for seven miles below the falls in a gorge from 200 to 400 yards in width. There the river opens into a flat country, and flows with a diminished current for 12 miles more, where its waters reach Lake Ontario, the least, although probably the best known, of the great Canadian lakes.

I must not detain you merely with description, and I certainly do not mean to attempt to describe Niagara; but as possibly this paper may be read by some who, from admiration of the beauties of creation, may think of a pilgrimage to that fair wonder, I may, perhaps, with some advantage in such a case call your attention to the grandeur of Niagara in winter. In America there may be a tendency to treat it as a fine water privilege, and on the spot in summer it certainly is horribly vulgarised by the influences that then surround it; but standing before it, when it is free from these, I can readily understand the poetry of the ancients leading them to personify, though unfortunately they also deified, their glades and their watercourses. Niagara seems essentially the queen or goddess, not the king or god, of waters. Notwithstanding the enormous mass of waters, which I leave others to compute, and notwithstanding that the roar of the descent has given it the name of the The Thunder of the Waters, there has always seemed to me a gentleness, a quietness, an imperturbable dignity, and yet a seductive coyness, a majesty and yet a play of consciousness about this beauteous wonder to which I know nothing akin save in the spirit of a woman. Broken, as it were, to fragments in the long and magnificent rapids above, the volume collects in exquisite dignity, so to speak, on the brink of its great catastrophe, and gliding unbroken over the awful edge shields itself only with a gossamer veil tinted with every glittering ethereal hue that ever imagination dreamed of. Though the misty pillar ascends a thousand feet into the heavens, and is visible from the far off opposite shores of Lake Ontario, the fleecy spray cloud as it falls like a drapery before the deep robe of the deity seems to weave itself in very playfulness into every pattern it may choose, never, with all its fairy gorgeousness, hiding or overpowering one ray from the rich sea-green and shell-like tints behind. In winter every accessory is in harmony with this scene. As you ascend the gorge you seem to have entered the precincts of the fairy queen. The majestic stalactites, pendant in long magnificent succession on either side of the precipitous banks, are columns of the same dream in diamonds, or pearls,

or frosted silver fillagree, yet all of the solidity of temple work. The trees festooned with the like draperies, the slenderest twig become a column or an arch, blend their proportions with the scene, and all seem to wear the livery of the palace of the fairy queen, who stands in the amphitheatre, that forms as it were her throne, in her unchanging glory of repose, for, strange though it may seem, this is, I think, the dominant impression made by dwelling on Niagara. Ondine and naiads become intelligible realities, and it is hard to believe that this fascinating water beauty, like many another made in a different mould, would remorselessly dash to destruction the maniac mad enough to entrust himself unto her. The illusion, perhaps you will say the dream, of a regal presence is not a little aided by the quiet which the waters again display at the very foot of the fall; but at the bend of the river, just beyond the Presence of the Queen, is the whirlpool with all the turmoil and confusion of the most disorderly ante-chamber of any drawing-room.

One more word of Niagara thus wreathed in winter glory. The cones, as the great masses of frozen ascending water and spray, formed at the foot of the falls, are termed, hem in, in continually diminished space, the cataract and the vapour formed in the never ceasing act of falling. These pinnacles, or rather mountains of ice, reach nearly and sometimes quite to the summit of the cataract, and gradually arching over towards the fall as the great mass gains more and more power to congeal the vapour rising and falling in contact with it, they have joined the ice stretching out from the river bank, or formed on every surface caught or exposed by the tumultuous rapid above. By such an arch the cataract has been sealed from the bottom of the cone below, and in and over such a chasm, nearly closing, I have seen the rainbow playing, shining with a vivid brilliancy as though composed of innumerable particles of crystallized, yet living, light. In places near the lesser cataract, the frozen skirtings admit of the closest approach to the fall, the chasm, and the cone, to the hemmed in cataract and the ascending volumes of spray, till it seems as though one were oneself enwrapped in the brightness of that bow as it springs out of this accumulation of beauty, and spans the gorge of the river with its other extremity, its summit in the heavens, and surrounded everywhere with another—and yet another reflection. It is like the living spirit of beauty joying in the scene. It is the bright bow of promise, a symbol higher than of man's invention, speaking of joy and peace, emblematic of the happy energies that it may be, constitute the realities of rest. I acknowledge to a feeling of solemnity and a sense of unspeakable beauty in this work of glory in the elements of light and water only, that put aside even fairy thoughts and dreams of imagination, while there stole over my senses a thought of the tradition of the day in which creation was good in the eye of the Maker, and the hope of that day when, with man in excellency, it shall be so again.

On one occasion, owing to what is commonly termed an ice-jam, Niagara ceased to flow! No water went over, and an adventurous Englishman, living on the banks, planted the flag of England in the

mid-channel of the rapids! They were dry! The sudden breaking asunder of that ice-pack, the renewal as it were of the cataract, must have been a glorious sight to see!

Lake Ontario, 190 miles long and 55 miles wide, has a mean depth of 600 feet, and an area of 6,300 square miles. With the exception of New London the chief towns of Upper Canada are on the borders of this lake. London, on the Thames, an inland town midway between the River St. Clair and the western extremity of Lake Ontario exemplifies the progress of Upper Canada. It is without advantages of either port or river navigation, and has achieved its success solely as an agricultural town. Five and thirty years ago not a tree was felled where it now stands; yet it is a solid handsome little town, in light-coloured brick chiefly, and, generally speaking, of good and unpretending architecture, whilst it now counts its population by thousands.

The Humber River, at Toronto, and the Trent River, which debouches in the beautiful Bay of Quinté, and forms the peninsula of Prince Edward county, have each been spoken of as affording a means of opening a communication between Lake Ontario and the Georgian Bay by Lake Simcoe, which is about midway between the two larger lakes. Either line, if it existed, would abbreviate the distance, and serve to avoid the dangers of the St. Clair Flats. Below Lake Ontario the St. Lawrence proper begins with that beautiful and far-famed expanse, the Lake of the Thousand Islands. The thriving little town of Brockville is the terminus of a railway gradually extending on the Upper Ottawa, and from Prescott there is another railway to the town of Ottawa, the great lumber dépôt, and the capital of Canada, possibly that of Confederate British America hereafter. The once picturesque Falls of the Ottawa River are turned to great account as a "water-privilege," "crowded" on every available spot with mills that allow no rest, day or night, to the ceaseless operations of the saw; but, whoever has once rejoiced in the wild beauty of the rivers and forests of America, can scarcely fail, even whilst he is endeavouring to forward the cause of civilisation, to regret that the steps of that civilisation are marked by the destruction of the wild beauties of nature even as its representative is wanting in the poetry that lingers round the savage. The analogy extends, I believe, farther, and the compensation and consolation are in either case the same. The desolation of the wilderness abounds over its beauty, and the vile among the savage is more common than the noble.

The rapids, which necessitated the construction of the St. Lawrence canals, in order that the river might be navigable, occur between Prescott and Montreal. Fifty miles below Montreal the river widens into the expanse called Lake St. Peter, broad, shallow, and with a soft bottom. The depth to which the channel of the river through this lake may be maintained, may be said to determine the maximum of draft of the scale of navigation above. That depth has, I believe, been fixed at 20 feet at low water. I may mention, as interesting in an engineering point of view, that the attempt to deepen this lake was unsuccessful so long as the effort was made by a straight cut instead

of in the natural bed of the river. From below Lake St. Peter the St. Lawrence adheres to its north-easterly course; but calls for no further particular remark in connection with the present subject. It becomes more and more picturesque, more wild, more grand, and, above all, perhaps, wider and more wide, until, as it were, characteristically winding-up the scale of its gigantic dimensions, its delta, so to speak, is Newfoundland, a territory one-fourth larger than the kingdom of Ireland, but almost unknown; yet a land of wild rugged beauty, with waters teeming with fish, and with resources deserving more investigation than they have hitherto received. The passage up the St. Lawrence is fast losing the terrors with which it became invested so long as injudicious regulations of the Canadian postal subsidy led to the attempted prosecution of the voyage in the midst of fog or snow, with the consequent loss or injury of vessel after vessel.

The chain of waters from the head-water of Lake Superior is about 2,500 miles in length.

The canal navigation has been constructed principally in order to overcome obstacles occurring in the course of the great chain of the waters we have now traced. This is the object of the Welland Canal between Lakes Erie and Ontario, and of the St. Lawrence canals between Prescott and Montreal.

The opening of the Rideau navigation between the cities of Ottawa and Kingston, and the partial improvement of the Ottawa River as far as the city of that name, were, however, owing to the proved necessity of a means of communication between the upper and lower parts of the united province, that should be free from the perils of the frontier.

The *proposed* canals, which I believe to exceed in importance all that have been constructed, are advocated in order to shorten distance, to lower the cost of freight, to increase trade, and to give rise to new branches and to new directions of commerce.

In order rightly to appreciate the bearings of the several projects brought forward to these ends, a consideration of the directions they adopt is necessary. The details of proposed construction, interesting as these are both in respect of the natural advantages which are afforded in the several cases, and as to the scale of construction, which would determine the class and size of vessels for which the improved navigation would become available, are yet of less importance than is the ultimate aim, or the consequences that inevitably would follow, upon the adoption of one or other of the schemes that are, and have been advocated. All have necessarily adhered, more or less, to the course of some apparent facilities or inducements for their adoption. They may be broadly classified as consisting of—

The enlargement of the existing canals from Lake Erie to Montreal. The construction of a navigation between the Georgian Bay, Lake Huron, and Lake Ontario.

The construction of enlarged canal navigation connecting Montreal and the Hudson River, State of New York.

The opening of the French river and Ottawa navigation, that is of a navigation following the course of the Ottawa as far as the Mattawa

tributary, and thence by Lake Nipissing and French River to Georgian Bay, Lake Huron.*

Of these, the last deserves an unreserved and unqualified preference on general considerations. It ought, indeed, to form the base and foundation of all others instead of being placed in comparison with, or in antagonism to, any other schemes of inland navigation; for it, and it alone, possesses this peculiar characteristic, that if constructed, it would make any of, or all, the others serve the prosperity and welfare of the province; but, if it were not constructed, each of the others would be attended with grave drawbacks and disadvantages. It does more, for it affords a cheap and peaceful solution of the difficulties attending the defence of Canada. If the country is to remain British, it is, therefore, a work of the first imperial interest, and if I have correctly named the most pressing want of Canada, it ought to be highly esteemed by the Canadians for its commercial value, if only as the means of establishing the security of the country, and thus re-attracting capital to its shores.

The general classification I have purposely adopted, almost of itself points out what the disadvantages of the other projects severally are, and you will remember that I have before asked your assent to the dicta that "directions of commerce shape the course of nations," and that "means of communications influence, so as to determine the directions of commerce."

The effect of the enlargement of the St. Lawrence and Welland canals would be to make seaports of the towns, both Canadian and foreign, on the inland lakes, and to confer upon those towns advantages similar to those which Montreal now exclusively possesses as the head of ocean navigation. It is, therefore, a commercial and political measure of much value. The fear of losing the monopoly of an advantage so enviable, may array the class and local interests of Montreal against a scheme that would create seaports to the very fountain head of the St. Lawrence waters, but Montreal itself could scarcely fail to benefit even more largely in so great and wide-spread a prosperity than she does now from her monopoly, though, like monopolists, she may be blind to advantages which lie dormant through neglect, and, like monopolists again, she may be even more mistaken as to the possibility of maintaining a policy which becomes unjust as well as ungenerous when persevered in to the depression of others for selfish ends. These canals, however, are constructed on or near the frontier, and would require at the least as much defence as they could possibly confer advantage, were the defence effectual; but the enlargement scarcely affects the military view of the question. The insecurity is not increased, the value is of that which is already insecure. Indeed, the enlargement of these canals may be not-wholly

* This route (Ottawa and French River) is that which was taken by Samuel Champlain, the discoverer; and thus Lake Huron was actually reached on the direct line before European eyes had seen Niagara. It is also that which was followed by the Algonquins to avoid their enemies, the Iroquois on the St. Lawrence. Thus we have only to adapt to the exigencies of the present time a pathway indicated by nature as the most direct, and marked by circumstances as secure and safe.—M. S.

devoid of military advantage, provided always that the French River navigation be perfected beforehand.

The construction of a navigation between Georgian Bay and Lake Ontario aims at abbreviating distance by a direct cut across a comparatively narrow neck of land, avoiding the circuitous route of the front, and the delay of the Welland as well as the dangers of the St. Clair Flats. It is, therefore, in some measure, a rival to the enlargement of the Welland Canal, and it seeks to secure carrying trade from the Western States. If executed as a commercial speculation it might benefit the foreign towns of the west and those on Lake Ontario, as well as local interests at its own extremities. Viewed in opposition to the other projects it is inferior to them, and by itself calculated to have injurious rather than good effects on the general prosperity of the province. Its military character is hypothetical, but not altogether without merit. Supposing there existed a naval force on Lake Ontario and an inferiority on Lake Erie, it would establish a good communication with Lake Huron, whereby the flank of Lake Erie would be turned, and the upper waters reached for offensive operations in the west.

The construction of an enlarged canal navigation, connecting Montreal with Lake Champlain and the Hudson, though different in locality, is not dissimilar in its tendencies. It would deflect at Montreal and after the passage of the St. Lawrence canals, that trade which the Georgian Bay Canal would intercept upon the lakes and carry to Oswego. It would give great additional facilities for the trade between Montreal and Boston and New York. It would, as far as art possibly could do so, substitute the foreign ports of Northern States for the highway of the St. Lawrence, and tend to complete and perpetuate that assimilation of tone, feeling, favour, and affection that springs from exclusive or preponderating commercial relations. If met by a corresponding appreciation on the part of Massachusetts, New York, and other States in the North, the ultimate effect of such intercourse, unbalanced by any corresponding increase of commercial relations with Europe, can be denied, only by a contradiction of the maxims I have asked you to concede. Unbalanced, such intercourse would necessarily be, for it can be formed only by the substitution of an artificial channel, and of foreign intercourse for the open ocean and commerce with home. The military aspects of this project are not of much importance. The line, if it were constructed, could be made ineffectual by either party, and its advantages used or destroyed according to the priority in skill or vigilance of either side. If viewed, however, as a commercial undertaking subsequent on, and subsidiary to, the enlargement of the St. Lawrence canals, this navigation assumes its proper and beneficial aspect. With the trade of the west free to find an ocean outlet at any port on the lakes, the freight to be carried will seek the best markets, and it would be judicious commercial policy to enable that trade to find those markets by the most perfect means of communication. The respective prices in North America and Europe would then more freely determine the destination of the products of the west.

So far, however, we have been considering the branches, not what ought to be the trunk of all inland British American navigation. The

question of primary interest to England in the whole matter is whether British America is to remain English; that of corresponding interest to the British provinces, and especially to Canada, is to know what their position is to be. A country of which the prosperity is paralysed and the development indefinitely retarded by a condition of uncertainty is forced by circumstances to think of something that irresistibly becomes of greater and more pressing weight, and of more immediate power than are even national predilections. These may exist, and exist strongly, and yet be compelled to remain what I have termed them, predilections—preference not choice. Circumstances may preclude a choice, aye, they may even compel a selection which is not a choice. The primary and pressing want of Canada is security and an assured sense of that security. So long as her future is thought to be undetermined, her energies are paralysed, her strength is fettered, and capital with its proverbial timidity keeps from her shores. Yet she has not on earth a foe to fear, except her contiguous and prosperous rival whose century of priority in birth is apt to be forgotten when comparison is made. The question, if not the temptation then naturally arises, can she not free herself from every danger by making common cause with the enemies of England. Her republican neighbours invite her with solemn acts of Congress, and frame their legislation with a view to her coercion. England informs her that her election shall be free. What then is her position at this moment but the monument of her decision and the proof of her attachment? And, if so, the question of her prosperity resolves itself into that of her defence, and the inland navigation of the province has so powerful a bearing on that question, that in dealing with the latter it cannot be passed by. I believe I shall state the condition of the question of defence with tolerable accuracy, if I say that England desires the connection if it can be maintained without imperilling even greater interests than would be compromised by severing that connection, and that Canada earnestly desires it if England will treat her, as she considers, fairly in the matter. It is the respective earnestness and hesitation of comparative adventure and comparative wealth. British America is ready to give an unequivocal response, if England will maintain her protection *à l'outrance*. England, before giving an irrevocable pledge, determines not only to examine her power to redeem the pledge, but to count also the cost of the attempt. Obviously too much caution may prove imprudence; and too great precipitancy might prove rash. This is, I fear, a full and fair exposition of the case as it appears to stand; but unless it be sadly deficient, moral and national obligations are counted as nothing in the matter, just as the negotiation fails to point out what could sanction the act of severance, and, in counting the cost, it omits the heaviest item of the bill, for who can answer what would prove the cost of wrenching the empire asunder, and of destroying the influence, character, and power of England as a matter of deliberate monetary speculation? I do not think it is to be concealed, that the sentiment of Canada has been grieved, and the moral strength of loyalty injuriously affected by what has been there taken to be the affront of a needless expression on the part of many English,

that they are welcome to sever the connection if they will. Historic precedent offers no justification of the assumption that the children of those who abandoned all to remain, as they believed, for ever children of a common mother should now be ready to change sides to the bitterest foes of England, if these latter know any truth in language. It would have been enough, reason the Canadians, to let the expression of the future be evolved from agreement or otherwise in the terms of a permanent connection. As the solution of the question of the British defence of Canada is on both sides emphatically one of will rather than of power, it is of the first importance to measure accurately the ingredients likely to make up that will. England seems to have required—I do not say she did require—I am advancing views which appeared to me to prevail, and that not unreasonably, in Canada—England seemed to many Canadians to require an unqualified expression of determination and to see that determination evinced in specified acts, before she would in any way bind herself to do more than establish a means of abandoning the continent on an emergency without the capture of her own immediate forces. Canada, too weak to stand alone, with the acts of the sympathisers in the troubled era of her rebellion fresh in her memory, with the fate of the Southern sovereignties before her eyes, and the language of bitter hate of England tingling in her ears, was called upon, or thought that she was called upon, to adopt a tone that would exasperate to the uttermost those upon whose tender mercies she might not impossibly be after all eventually thrown. Simultaneously writings were diligently disseminated over the length and breadth of the province, disparaging the province and the British connection, and exalting all the ways and characteristics of the enemies of England. Writings that owed the attention which they gained neither to the matter they contained nor to the quarter from whence they seemed to issue, and which, rightly or wrongly, were very generally deemed to represent predetermined intentions that seemed increasingly in danger of being carried out in the policy of England. Having thus paralysed the energies of Canada, it was not difficult to represent her as backward in deed and lukewarm in attachment. All these circumstances require to be carefully weighed and borne in mind or, I believe, a very erroneous estimate will be formed both of the strength of attachment to British rule in Canada and of the conduct and policy of England in the question of rendering secure, or even possible, the continuation of the bond between the countries. But to revert to that of the cost to England of pledging herself to the defence of Canada. The general impression as to that defence, where there has been any thought at all about it, is probably derived from considerations in which the distance from the base of operations, the extent of frontier, the small number of the imperial forces in proportion to the extent of the empire, and an assumed overwhelming superiority of hostile numbers are the principal ingredients. The result is far from favourable, and the extent to which it is deemed politic to put forth the power of England is probably expressed in the arrangements for the

evacuation of the country at a minimum of all save moral dishonour.

I believe however, that, like giants in a mist, the several difficulties will much diminish, and some even lose all their force on nearer examination. Granted that the enemy has his base of operations comparatively close at hand, that, irrespective of his resources on the Atlantic coast, he can supply himself from the lake shores immediately opposite and maintain his lines of communication by numerous railroads, that his numbers are incontestably superior and that the frontier is of very great extent, still much remains to be said and done before the cause has to be given up. The very inferiority confers specific advantages of no mean value. If the distance of the base of operations, where it is the ocean, is to be an insuperable obstacle, then farewell all imperial greatness and possession; but great in extent as is the frontier, those portions of it on which descent in force is possible can all be specified, and the very priority of development and superiority in wealth and resources of the enemy have their counter-vailing evils to his cause. To guard the country sacred from the tread of the invader's foot may indeed be deemed a hopeless task unless he can be forced to abstain from the attempt in the prospect of ultimate defeat, or of drawing down upon himself losses greater than the intended gain; but the important posts and towns of Canada can be counted, and a very inferior force might hold them all successfully, though the rest of the country were for awhile overrun, and columns, well commanded, that would retaliate on the enemy by counter-aggression might serve to open wide the eyes that may even now be dreaming of the tempting sweets of overrunning a defenceless province and of the glory of a triumph over the hated name of England, achieved with the pride of the semblance but with none of the realities of difficulty. Whilst the enemy could subsist only by the maintenance of his own lines of communication, the columns carrying the war into his territory would find subsistence everywhere. The facilities for counter-aggression are an effectual means in Canada's defence. My own conviction, as I have said, is that the important ports and towns of Canada admit of being held by numbers relatively very inferior, nor have I any doubt whatever of the willingness of the Canadians not only to undertake the task of such defence, but to seek their share besides in turning the tables on the enemy by the necessary counter-aggressions. Even the important battle-grounds may be known beforehand and entrenched and occupied so as greatly to counterbalance superiority of number. Nor must the numbers of the enemy be computed from the scale of the late civil war. The acquisition of Canada could not evoke an effort that required a spirit of animosity such as the civil war provoked. Such an exhibition, if it took place at all again, would be directed against England, wherever her power might be found, and would be too bitter to be appeased without collision. It would not be a war for unity, and as yet the Republican States are not at all at unity. Moreover, the influx of European strength and sinew which brought about the subjugation of the South would scarcely, in such a case, be allowed to go on un-

checked; nor is it to be supposed that England would be without European allies, for she certainly would not willingly go to war, even with her alienated and embittered descendants, unless not only clearly in the right but compelled by the necessities of an irreconcilable difference. That in a war the Canadians would be as ourselves there is no reasonable ground to doubt, and the enemy could not, for their subjugation only, raise the forces we have become accustomed to associate with his name.*

* I have not been able to avoid what may have seemed like a digression on the defence of Canada, but it is *because the proposed navigation which remains to be considered, deprives that important question of its formidable aspect.*

The Ottawa River joins the St. Lawrence where the islands on which is Montreal are, in about $45^{\circ} 31'$ N. lat. The mouth of the French River is approximately in lat. 46° , that of the Mattawa in about $46^{\circ} 20'$. The course marked out by these rivers is therefore very nearly direct: the connection is almost complete. The distance is 430 miles, and shorter by 368 miles than the frontier route between the points which it connects. The saving in time, which depends on lockage, capacity, and other considerations, is estimated at 44 hours; the cost of movement per ton is computed under that of the existing or of the other proposed routes. The line marked by these rivers perfectly fulfils the essential military condition of being removed from the frontier. Indeed I do not know that there is a military requisite that can be desired, which it does not afford. Its general characteristic from end to end is that of a chasm in a granitic formation (crystalline gneiss), and on the French River more especially, in long straight lines, where a few guns in position could defend the necessary works, and destroy any fleet that might attempt to enter, and where the position of these guns would be impregnable. The direction of the French River, at its mouth, is N.E. to S.W.; the mouth itself, a straight cleft, deep and broad, about two and three-quarter miles in length, and the formation such, that whilst coasting along is highly dangerous, there are direct entrances between the rocks. The harbour on Lake Huron (Georgian Bay) is studded by small islands, with broad channels and deep soundings between. The archipelago of the Georgian Bay perfects the position for a fleet or for gunboats, which, whilst they could only be pursued at heavy disadvantage, would be ready at any moment to pursue or to attack the enemy.

If this communication were opened, so long as England retained her supremacy on the ocean—and it is not worth while to discuss any English Imperial subject on any other supposition—gunboats could be placed as freely on the lakes as now on the St. Lawrence at Quebec; and if a war must come, it would be as much a naval war as one on land, with victory to be contended for as heroically and as sternly on the far inland lakes of America as ever naval war was fought by the

* The opinions expressed above have received a striking corroboration in the prompt repression of the Fenian threats of invasion through the *instant* turning out of an adequate volunteer force.—M. S.

sailors of England on the ocean. There would be as little reason for abandoning Lake Huron as for abandoning Quebec. The latter we seem to have determined not to do unless we bid farewell to all the continent; but Upper Canada would then be as defensible as is Quebec. The voice from the Western province, which has been heard remaining faithful and true when told that province would be left an undefended battle-ground to be desolated by the enemy, would give no undetermined sound with such a guarantee for its security. This great essential work constructed, all the wants and conditions of the country can be met. It would give backbone and solidity to the whole province. From it as the base of operations, the frontier itself can be secured in all essential points, and works, dangerous, if not disastrous, if undertaken in its default, become of advantage and almost secure. Either the Welland, the Georgian Bay, or Rideau lines can be made to admit fleets or gunboats into Lake Ontario, and even without these, the defence of that lake can be independently provided for.

These are, I think, sufficient reasons for placing this work not only above any competitor, but for taking it altogether out of the category, for comparison. It alone is a work of thoroughly imperial interest. Such is its national and military value, though a work commercial and civil in its nature, that I do not believe it is too much to say, that it is the best work of defence that could be erected in Canada, and even one without which that defence might possibly prove as ineffectual and the attempt as impolitic as they have been assumed to be.

I had hoped to enter on some further details of this very interesting route, but the time for which I could hope to command your attention, and for which I am allowed to solicit it, forbids. I must therefore confine these to the Appendix, and will only add that His Excellency the Commander of the Forces, Administrator of the Government, and, I believe, also the Admiral of the North American station, whom I had the honour of being invited to accompany over the route, are as favourable to its construction, and earnest for it, I think, on the grounds I have endeavoured to place before you, as I can possibly be. The length to be artificially improved is 58 miles, which includes, however, the reconstruction of the Lachine Canal. The aggregate lockage is 693 feet. The cost has been estimated from two and a half to five millions sterling, according to the views on which the respective estimates have been based. It must be remembered that this is an outlay that has been advocated, and advocated ably, on commercial grounds alone; that it is a sum that would certainly bring a direct measure of return, besides conferring security upon, and thereby wealth throughout the province.

The objection to leaving it to be constructed as a commercial work lies in the rival routes to which I have adverted. Under that aspect it has to contend against local interests and sectional jealousies; against the rivalry especially of those interests least favourable to British connection and most induced to seek personal wealth, and to care little for any national existence. It would besides traverse a new country, along the immediate banks of which not only is there no population at present, but the very formation which renders it supremely valuable

for military purposes, precludes the possibility of its becoming the seat of a population of similar extent to that occupying the comparatively alluvial lands of the frontier. It derives its monetary value, more particularly between Lake Huron and the Ottawa, as a channel of transit from the west.

I opened this paper by calling your attention to the fact that the water system of the St. Lawrence, as a whole, is but one of several that traverse the length and breadth of Northern America. That branch of the St. Lawrence navigation which I have last brought to your notice is in the direct line to the west. In point of fact it would shorten the distance to the west by nearly 400 miles. The richness of that west has not been overdrawn. The facts of * Minnesota are before us, and we hear continually of unexpected sources of wealth in rugged and barren districts beyond, that may well create some astonishment that the mineral wealth of Canada in Lake Superior is almost untouched. True, the possessors of the soil of interior British America seem still to deem that they can reap no present profit from it save by its seclusion; but their predecessors thought the same, when they virtually held the destinies of many now prosperous components of the republican states and of several British provinces in their hands. They were in error then; their successors may be so now.

Be this, however, as it may, I have shewn you how nearly the great waters are everywhere connected, and the time is probably not distant when, under whatever circumstances, steamers on the midland system may approach to the foot of the Rocky Mountains of the west from Fort Garry, the centre of the northern continent; and when others, plying on the rivers and lakes intervening between that country and Lake Superior, may complete a traverse of two-thirds of the continent; and as the country of the Athabasca is unquestionably attractive, and the Peace and Mackenzie Rivers are with scarcely an obstacle to their navigation, even that northern system may become peopled in its southern portions, and the north be the resort of their whalers in the Arctic Ocean. Who shall say these several systems may not become connected? Certainly they would have been so ere now had the efforts

* "What cotton is to the South, wheat is to Minnesota. If cotton is king, surely wheat is queen. In 1860, the wheat crop of Minnesota amounted to over five million bushels, being nearly five times greater than they raised in the New England States. The yield has been steadily increasing each year, and now the crop for 1865 will not fall short of twelve million bushels, an average of twenty-seven bushels to the acre. In Ohio, the largest crop ever grown (that of 1850) only yielded seventeen and one-third bushels to the acre, while the average for ten years was but twelve and a half bushels. In Iowa, which is generally considered one of the richest agricultural states in the West, the crops do not average more than fourteen bushels, while in New York and the New England States the yield is about 40 per cent. less. When you take into consideration the fact that there are not more than 250,000 inhabitants in Minnesota, this yield of grain seems enormous. Forty-eight bushels of wheat for every inhabitant, man, woman, and child! Why, Egypt in its palmiest days could not boast of more than this. The valley of the Mississippi overshadows the valley of the Nile, and Pharaohs are nowhere. The superior quality of Minnesota wheat is shown in the weight of the grain, and its suitability for milling purposes. It weighs from 62lb. to 70lb. to the bushel, while in Ohio and Pennsylvania it averages from 50lb. to 60lb."—*New York Herald*.

of men been only directed to the energies of life, as they are to necessary vigilance for the powers of mutual destruction.

The great interior has been offered to Canada, and she has accepted the offer. I do not myself think the acceptance of that offer has on her part been judicious, and for this reason, that there is even a superabundant call for her exertions within her present limits. To the works we have briefly reviewed must be added the intercolonial railroad, and the aggregate is enough to tax her energies, if not to surpass her power. The injury and disparagement she has received from the continual addition to the peopled territories of her neighbours while her own west has been hermetically sealed, no doubt served to determine her reply; but if the terms of the acceptance exceed her power at present, those unquestionably best informed upon the subject are most alive to the now imminent danger of delay, and their conviction is both strong and decided, that the security of Canada, and indeed the ultimate presence of England both in the Atlantic and the Pacific, is involved in the speedy action of the Imperial Government to secure an organised government, the security both of person and property, for Central British America. I think, therefore, it is to be most earnestly desired, that the question of the defence of Canada may be dealt with on something more than mere technical terms; not viewed as a question of a regiment more or less in this place or another, nor of a barrack or a storehouse here or there; not left to be disposed of piecemeal, if I may be allowed the expression, but that it may be merged in the greater question whether the provinces existing or to be born, can remain in their allegiance with benefit to us and to themselves; and, if the answer be in the affirmative, that such measures may be adopted in the interests of America, as well as of England, as will, humanly speaking, place the issue beyond reach of cavil or disturbance. I can picture to myself no greater perils to peace than arise from unpreparedness for war and from indecision.

I regret that I cannot, within the limits of our time, enter upon any considerations relative to the execution of the navigation by the Ottawa and French Rivers; and also that I have been prevented for the same reason from giving details of the great existing works; but I hope I have judged aright, that it would be most useful as well as most acceptable to present to the best of my ability the outline or foundation of the entire subject, rather than to overload a section with particulars which could not even then be made sufficiently minute.

More than all I could have wished, had time permitted and the occasion fitted, to have sought to draw your attention to the difference involved in maintaining or in abandoning British dominion in the presence of the adjoining republican states of America. I refer not now to imperial greatness, though I fully believe that England can maintain no greatness, possibly not even her independence, unless she maintain her imperial possessions; but I refer to something higher and greater than the instrument, that to which dominion ought to be the instrument, and to which, in the case of England more than of any other power, I believe it has been the instrument, I mean—the moral, social, and individual effects of right power lawfully established. I may not dilate

upon this subject, time and circumstance forbid; but the history of the past and the events of the day speak, for me more strongly than mere language could. I will only say, so far as I have known, that this difference is more highly appreciated throughout America than here. There the contrast is more familiar. It is the cause alike of the attachment to, and of the hatred of England, which respectively distinguish British America and the republican states. It is now more than twenty years since I was the guest of one who had sought not the towns of the severed republics, but the forests of the colonies of England, for his future home. Looking from the window of his house on to the farm and fields which he had cleared, he told me that he had, it was then, I think, five-and-twenty years before, come to that spot with, in his own words, as well as I remember, an axe upon his shoulder and God above him as his trust. He had lived on in that trust and confidence: he understood its origin and its strength. Such are the men who, in the words of Jeremy Taylor, have lived "stewards of creation, ministers of Divine Providence, and kings and priests to God," and such I have ever found the most attached to British rule and its perpetuance; and that in proportion as they felt and acted out such principles. They entertain a staid conviction that the earthly strength of human hope is vested in England, and springs from her principles, that these have been the source of all her greatness, and that that greatness ought to be the sacred guardian of those principles. It is this conviction, not the lust of wide spread imperial dominion that is the life of their affection. In truth England stands conspicuously alone amidst the nations of the earth in having nationally received, avowed, and maintained those principles which we, from the very strength of our adoption, term old English. Then how explain that hate of England which is the strongest * characteristic of the severed colonies, except by the evidences which time but too bountifully affords. The subjected sovereignties of the south are not the only testimony that there liberty is the by-word for intolerance, equality the muzzling of excellence, and brotherhood the motto of oppression. They who learn this lore from examples living out the difference, will come back seeking to enlist you with no common earnestness, and they will entreat you,

If you value the principles of England, hold her territories fast.

* Extract from report by the Chief Superintendent of Education, Upper Canada:—

"In regard to the exclusion of American books from the schools, I have explained that it is not because they are foreign books simply that they are excluded, but because they are, with very few exceptions, anti-British in every sense of the word. They are unlike the school-books of any other nation, so far as I have the means of knowing. The school-books of Germany, France, and Great Britain, contain nothing hostile to the character of any other nation. American school-books, with very few exceptions, abound in statements prejudicial to the institutions of the British nation."

We hear, occasionally, a great deal about "America for the Americans." It is not a little singular that the only persons possessing the slightest claims to any exclusive right to the name of Americans, or to the possession of the soil, should be termed "*Indians*," and should be daily more and more dispossessed of life, as well as land, by these exclusive European republicans.—M. S.

APPENDIX.

A. ELEVATIONS, AREAS, &c., OF THE GREAT LAKES, AND OF CERTAIN OF THE MINOR LAKES OF CANADA.

Name of Lake.	Elevation above tide-water at Three Rivers.	Dimensions.			Area in Square Miles.	Remarks.
		Extreme width.	Extreme length.	Mean depth.		
Superior	Feet 598	Miles 160	Miles 400	Feet 900	32,000	NOTE.—The elevations of all the Canadian lakes are made to refer to TIDE WATER AT THREE RIVERS, the highest point at which the ebb is perceptible in the St. Lawrence. High-spring tides at QUEBEC rise 19½ feet. Average spring tides at QUEBEC rise 17 feet. Neap tides at QUEBEC rise 11½ feet.
Michigan....	578	80	330	900	17,000	
Huron.....	574	160	260	900	21,000	
Erie.....	564	60	240	120	7,500	
Ontario	234	55	190	600	6,300	
Nipissing....	634	..	..	..	..	Discharges by the "French River," into Lake Huron.
Simcoe.....	706	..	..	..	..	Discharges by the "Severn" into Georgian Bay, Lake Huron.
Rice Lake ..	599	..	..	..	..	Discharges by the "Trent."
Balsam Lake.	823	..	..	..	..	Balsam Lake is the head of the "Trent Waters," which discharge into the Bay of Quinté, Lake Ontario.

W. S.,

Montreal, 7th Oct., 1865.

Obligingly furnished by Mr. Walter Shanly.

B. MEMORANDUM RELATING TO THE CANADIAN CANALS.

WELLAND CANAL.

Total amount expended to 1862.....	\$7,200,000
Main line from Port Colborne, on Lake Erie, to Port Dalhousie, on Lake Ontario	28 miles
Feeder Branch, from Grand River at Dumville to "The Junction"	21 "
Broad Creek Branch to Port Maitland, on Lake Erie	2 "
Total length	51 "
Total rise from Lake Ontario to Grand River Level	338 feet.
Number of locks (ascending)	26

The Grand River level is 8 feet above Lake Erie; consequently, vessels ascending from Lake Ontario, have to lock down from the summit into Lake Erie.

The deepening of the summit level is now being proceeded with, so as to admit the water from Lake Erie. When this is accomplished, the Grand River feeder, which at present is the only source from which water is supplied, can be dispensed with. This work will probably be completed in 1866.

Size of Locks.

Between Lake Ontario and St. Catharine's (2), 200 feet long, 45 feet wide, 10 feet deep.

Between St. Catherine's and summit (24), 150 feet long, 26½ feet wide, 10 feet deep.

Entrance locks at ports Colborne and Maitland (2), 200 feet long, 45 feet wide, 10 feet deep.

ST. LAWRENCE CANALS.

Total amount expended to end of 1861 \$7,300,000

These canals comprise :—

The Lachine	having	5 locks	=	44¾' rise,	8½ miles long.
The Beauharnois	"	9 "	"	82½' "	11¼ "
The Cornwall ..	"	6 "	"	48' "	11½ "

The Williamsburgh, viz. :—

Fanrus Point ..	"	1 "	"	4' "	¾ "
Rapide Plat....	"	2 "	"	11½' "	3¼ "
{ Iroquois .. }	"	3 "	"	15¾' "	7⅝ "
{ Junction .. }	"				
{ Gallops.... }	"				
Totals.....		26		206½	43¾

Size of Locks.

200 feet long, 45 feet wide, 9 feet deep.

ELEVATIONS FROM TIDE WATER TO LAKE ERIE.

Montreal and tide water at Three Rivers.....	13 feet.
Lake Ontario and Montreal, viz. :—	
St. Lawrence Canals, say	206 feet
Intermediate fall.....	16 "
	222 "
Lake Erie and Lake Ontario	330 "
Total	565 "
Lake Huron and Lake Erie, about	8 feet.

Obligingly furnished by Mr. Walter Shanly.

C. ABRIDGED EXTRACT FROM MR. T. C. CLARK'S REPORT.

Taken from "Eighty Years' Progress."

	Distances.		Levels.		Cost.
	Rivers and lakes.	Canals.	No. of Locks.	Lockage.	
	Miles.	Miles.		Feet.	
Lachine Canal	..	8.50	5	43.75	
Lake San Louis	13.31	..	..	..	
St. Anne	..	1.19	1	1.00	
Lake of Two Mountains	24.70	..	..	..	
Carillon to Grenville	7.73	5.	7	58.50	
Green Shoals	..	.1	..	..	
Ottawa River	55.97	..	..	..	
Chaudiere River and Des Chênes	3.75	2.61	6	63.00	
Des Chênes Lake	26.69	..	..	..	
Chats	1.70	.60	5	50.00	
Chats Lake	19.28	..	..	..	
Chenault to Black Falls	18.32	1.05	11	104.00	
River and Lake Coulange	24.93	..	..	..	
Chapeau and L'Islet	4.85	.14	2	18.00	
Deep River	33.58	..	..	..	
Joachim to Mattawan	51.74	2.26	14	148.20	
River Mattawan	16.22	1.08	11	144.00	
Summit Level Cut	51.15	5.97	..	..	
French River	47.52	.82	7	77.00	
Totals	401.44	29.32	64	665.70	\$12,057,680

N.B.—Scale of navigation, 250ft. x 45ft. x 12ft.

D. TABLE OF COMPARATIVE DISTANCES.

	Miles.				Lockage.		
	Lake.	River.	Canal.	Total.	Up.	Down.	Total.
Welland	1145	132	71	1348	..	535	535
Toronto and Georgian Bay..	775	155	120	1050	130	675	805
French River and Ottawa ..	575	347	58	980	83	615	698

E. MR. MACALPINE'S TABLE, FORMING BASIS OF MR. SHANLY'S ESTIMATE.

	Cost of movement per ton per mill.
Ocean—Long Voyage	1 mill.
Short "	2 to 4 mills.
Lake—Long "	2 "
Short "	3 to 4 "
Rivers—Hudson and Lake	2½ "
St. Lawrence and Mississippi	3 "
Tributaries of Mississippi	5 to 10 "
Canals—Erie enlargement	4 "
Other large canals, but shorter	5 to 6 "
Erie, ordinary size	5 "
With great lockage	6 to 8 "
Railroads—Transporting coal	6 to 10 "
Not ditto, favourable grades and lines	12½ "
Steep grades	15 to 25 "

Add tolls, which swells the cost on Erie as it is to 14 mills. per ton per mile.

MR. SHANLY'S ESTIMATE TO MONTREAL.

		Time. Hours.
1. Welland and St. Lawrence Canals :—		
Lake navigation, 1145 miles at 2 mills.	\$2.29	159a
River " 132 " 3 "	.40	24b
Canal " 71 " 8 "	.57	13c
Net	\$3.36	196
2. Toronto and Georgian Bay :—		
Lake navigation, 775 miles, at 2 mills.	\$1.55	
River " 155 " 3 "	.46	116a
Canal (Toronto and Georgian Bay) navigation, 77 miles at 12 mills.	.92	40b
Canal (St. Lawrence) navigation, 43 miles, at 8 mills.	.34	20c
Net	\$3.27	176
3. French River and Ottawa :—		
Lake navigation, 575 miles at 2 mills.	\$1.55	115a
River " 347 " 3 "	1.04	19b
Canal " 58 " 12 "	.70	18c
Net	\$2.89	152

Based on Mr. MacAlpine's minimum for lake and maximum for rivers: not unduly favourable to Ottawa.

a, lake and river. b, canal. c, lockage.

1. Welland Route :—

Chicago to Caughnawaga (deduct Lachine charge	\$3.12
Caughnawaga canal. 33 miles at 8 mills	\$0.26
St. John's to Whitehall River and Lake 120 " 3 "	.36
Champlain Canal. 65 " 8 "	.52
Hudson River Walesford to New York 155 " 2½ "	.39
	1.53

Distance.. 1721

\$4.72

2. Toronto and Georgian Bay :—	
Chicago to Caughnawaga, as above	\$3.20
Caughnawaga to New York.....	1.53
1,423 miles.	<u>\$4.73</u>
3. Ottawa and French River :—	
Chicago to Caughnawaga.....	\$2.82
Caughnawaga to New York.....	1.53
	<u>\$4.35</u>

MR. SHANLY.

Capitulation :—	
River and Lake navigation	372 miles
Canal (including Lachine).....	58 "
Total	<u>430 distance.</u>
Rise, Lake Huron to Summit.....	83 feet.
Lockage.....	82 "
Fall, Summit to Montreal	642 "
Lockage.....	615 "
Total lockage, 698 feet.	

Fifty-eight miles at \$370'000.

For Removal of shoals, \$2'250'000 lump sum,
£4,931,506 sterling.

Season of Navigation—On Welland.....	209 days
On route, say	169 "

Lives lost on St. Lawrence, 1857, \$1'387'935,
Lives 490.

MR. EDWARD W. WATKIN, M.P. : I am sure we are unanimous in thanking Colonel Synge for the excellent paper he has read on a subject of so much interest to us. Whether we are familiar with the geography of this vast American continent or not, it has often struck me, with regard to our statesmen, that if their scholastic preceptors had only taken a little more pains with them with reference to the possessions of the British Empire, we should have had fewer mistakes in the commercial and other treaties which have been made. And I think, with every respect for Lord Ashburton as a man of great distinction, and of great position, if he had only known a little more of the proper geographical boundaries of our empire, he certainly would not have given away that piece of Maine, which I think is a little larger than Scotland, on the mere showing of a map, which, undoubtedly, now is recognised as a forgery. I think Colonel Synge, apart from dealing with the question of the colonisation of Canada, and apart from pointing out the shortest route between Europe and the great corn-growing districts of the West, has entered upon a question which is of the greatest imperial moment, viz., whether we are to keep, if not extend, the boundaries of the empire, or whether we are to give up, piece after piece, possessions which, populated some day or another, ought to contribute largely to the glory of our country, merely to conciliate a Power occasionally hostile, and which would be peaceable in proportion as we held our own. Now, I am somewhat familiar with portions of these great regions, and it seems to me that no mistake could be so large, no mistake could involve such disgrace, as that which would be committed by the legislature of this country if ever they took away the influence of the British Crown from the northern part of North America. What is our position? Let us look at it first, physically. We possess more than half that great northern continent of America, which stretches from the Gulf of Mexico to the Arctic regions.

We have within the dominions of the Queen a larger portion of accessible territory by far than that which is possessed at present by the United States. We have a climate there which, though as regards some portions of it, may be rigorous, is a climate which makes men strong, and able, and enduring, and makes a nation hardy and brave. The proposal is that, in order to provide for some temporary peace with the United States, that territory shall be abandoned; and the British Empire shall in future I suppose, be described by geographers as England, Ireland and Scotland, and the Isle of Man. I am one of those who believe in a large country. I should be sorry, indeed, to be the citizen of a little one. I go in for as much territory as we have got, and for as much more as we can get; because I believe the liberty enjoyed by our country is the greatest and best liberty which human history has ever been able to record; I believe our civilisation is the highest and purest civilisation which, at present exists upon any portion of the globe; and I believe the great mission committed to us, in consideration of the great power and riches we possess, is to extend that civilisation into every portion of the globe. Then, I come to the question of the physical means to secure this. There is no physical agency so great as intercommunication. What Sicily was in a small degree to ancient Rome, the Western States are to this country and to Europe at large. There are the great granaries, within ten days of Europe, which are to feed our population, increasing beyond the physical resources of our own country. Under these circumstances, Colonel Syngé proposes that we should shorten the distance between this country and those great corn-growing districts of the West by 400 miles at an expense of £3,000,000 of money. I do not know whether he proposes that Mr. Gladstone should provide the money in any of his budgets. Mr. Gladstone is a most able Finance Minister, but I am afraid with his principles of economy that the money is not likely to be obtained from that source. Colonel Syngé proposes that the thing shall be done in concert between this country and Canada, and the North American provinces. Of course, the vast property which exists in that portion of the continent of America would be practically mortgaged in order to secure this great work. Nobody can complain of that, except the gentlemen who seem to be always ready to advocate the interests of the United States, forgetting the extent of the territory we have at our command, and the devotion, industry, and courage of the four millions of people who at present inhabit that portion of the territory which lies between Lake Superior and the ocean. In addition to this, the Hudson's Bay territory has to be considered. There we have a great prairie, the only one unoccupied upon the American continent. We have that prairie intersected by rivers which run east and west, and give facilities of communication east and west; a prairie with which those of Illinois and Ohio and the other States of America are not to be compared. That brings us back to the question, do we still intend to retain these provinces of North America? For myself, I am for retaining all the territory we have got. Just as in this country, and in every old country, a man is received and respected as a solid man, who, in addition to his money, his business, and his moveable property, possesses a solid estate, a portion of the soil of his country, so, I believe, that every nation is prominently great in the eyes of all surrounding nations, by having, not merely a large business, not merely large customs' duties, considerable trade, large balances in banks, Limited Liability Companies, and everything of that kind; but a broad and constantly increasing portion of that earth's surface which, after all, is the mother and source of all the wealth that surrounds us.

Mr. Gzowski, C.E., of Toronto: My friend, Colonel Syngé, has asked me to speak. He has covered the ground so cleverly, and Mr. Watkin, whom I have the pleasure of knowing, has advanced views so thoroughly Canadian that there is very little left for me to say. I do believe, with Mr. Watkin that the real greatness of an empire lies not in chattels, but in real estate; and that it would be a cruelty to the Canadians to make them feel that they are to be given up, and handed over as property of so much value to those who have no good feeling towards this country. Colonel Syngé's description of the lakes and rivers, and the facilities of communication is very correct, and may be relied upon in every respect. As an engineer, I have gone over every inch of the ground he has described, and I can speak from personal knowledge that he has been guilty of no exaggeration. With reference to the construction of the Ottawa Canal,

that is a question which must be more minutely examined ; but I believe the figures mentioned are not very far astray, as Mr. Watkin has truly said, it is a question whether in view of maintaining that large territory, it is worth while to incur an expenditure to make the Canadians feel that they are part and parcel of the British Empire.

The CHAIRMAN : If no other gentleman wishes to address the meeting, I have to move the usual vote of thanks to Colonel Synge for the very elaborate paper which he has read this evening. The questions he has placed before us are of such vast magnitude, that I, who do not pretend to have any acquaintance with them, shall certainly not detain you by any observations of my own. We have also heard a very patriotic and eloquent speech from Mr. Watkin. I think Mr. Watkin takes a view which is held by a great many of our fellow-countrymen, that we should hold what we have got. But when he goes further and says we should get what we can, I confess that I cannot go so far as that with him. Every naval officer must be well aware that, although we have a great many points on this globe that are most useful to us as stations, yet our colonies are now so very numerous, that to add to the points which, in the event of a war, we must defend chiefly by our fleet, would be to impose liabilities upon the country which it is desirable to keep within due limits. If we were to follow up the dictum of Mr. Watkin and get what we can, we should have such a large extent of territory, and so many points to defend, many of which are not easily defended, that we may find it desirable to reduce rather than to increase the number of our dependencies.